Turing's thesis and termination verification

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While the Church - Turing thesis is studied by undergraduates in computer science, only a small community of logicians even know of Turing's PhD thesis (under Church!) on ordinal logics. His main idea was to enrich a (Gödel-style) incomplete system L1 to obtain a “more complete” system L2, and iterating this process, obtain a transfinite progression. Turing then went on to prove a form of weak completeness for this process.

If we follow the Turing recipe to a specific issue, that of statements on termination of Turing machines, we get a similar progression of provers and verifiers, increasingly powerful. Recent research suggests that this may have some practical implications as yet.